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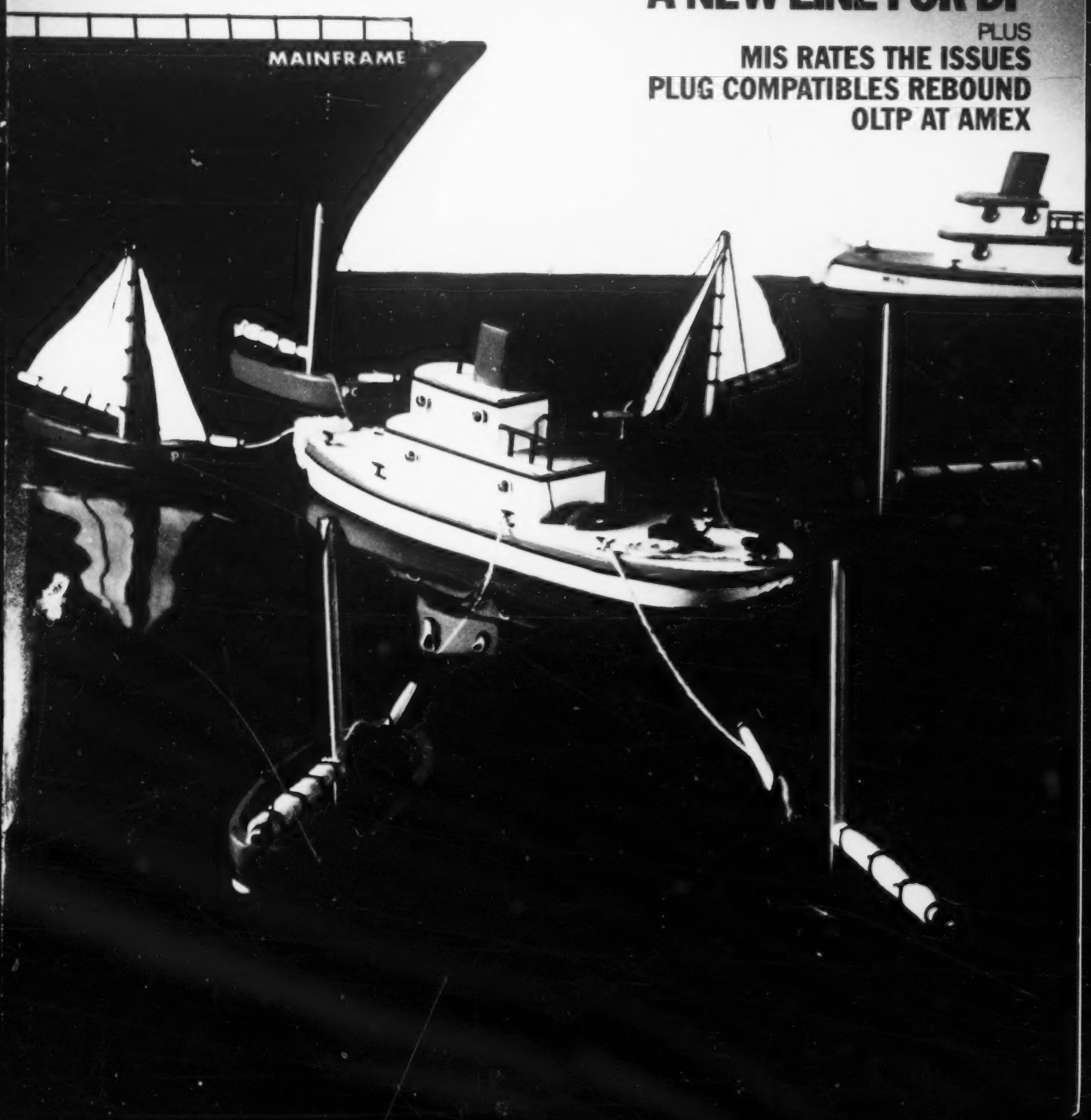

DATAMATION

NOVEMBER 15, 1986/$3 U.S.A.
VOLUME 32 NUMBER 22
This issue, 191,170 copies

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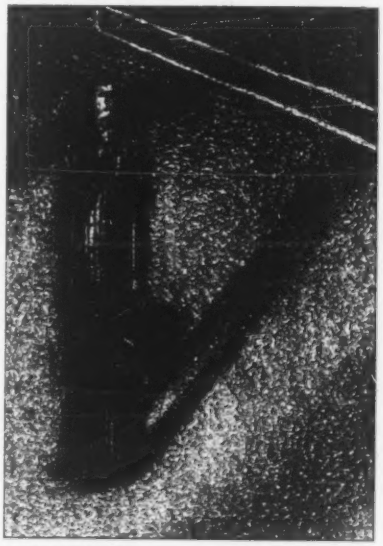

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Cahners Publishing Company, A Division of Reed Publishing USA. Specialized Business and Consumer Magazines for Building & Construction, Interior Design, Electronics & Computers, Foodservice & Lodging, Manufacturing, Book Publishing & Libraries, Medical/Health Care, Child Care & Development.

Our annual survey shows oems and vars are selling more systems and making less money.

MORE FOR LESS

by Edith Holmes

The year 1985 was a banner one for end users looking for bargains in small systems; for them, the industry slump paid off by bringing prices down. But original equipment manufacturers and value-added resellers weren't thrilled: they had to sell more computers and peripherals to meet their revenue goals.

These general conclusions are spelled out in a recently released survey of the oem/systems house market. To a large extent, the current year is little changed from the last. The annual survey by Technical Publishing Co., publisher of DATAMATION, shows that while the number of oems and vars participating in its study jumped from 2,011 to 4,256 firms, a 112% increase, the value of the systems they sold grew only 34%. For the majority of the companies in this market, the average value of each system sold fell more than $9,500.

The survey—which represents roughly 75% of the total domestic oem/systems house market—also shows that in 1985 IBM stole the march on Digital Equipment Corp. in a minicomputer market that shrank 16% (see Fig. 1). In the meantime, IBM continued to outdistance its competition in the booming oem micro market—a field that grew 71.6% (see Fig. 2).

In 1985, the 4,256 firms included in Technical's 1986 edition of the *Directory of Systems Houses and Computer Oems* sold 233,893 computer systems for $5.1 billion. A year earlier, the directory listed 2,011 companies selling 155,574 systems for $3.8 billion. The doubling of the survey's database makes many direct comparisons between 1984 and 1985 data unwise, if not impossible. It isn't possible, for example, to determine what improvement 1985 oem sales achieved over those in 1984.

But the average system price of $21,804 in 1985, compared with $24,426 in 1984, suggests that last year the industry's integrators and resellers could not afford to sit back and wait for customers to come to them.

Indeed, other data indicate that many of these firms saw the value of the systems they sold drop far more than $2,622 between 1984 and 1985. Hardware/product oems and systems houses and integrators—companies that in Technical's survey account for 78% of the value of the systems sold, or nearly $4 billion, and 58% of the systems sold, some 135,658 computers—sold their products for $9,585 less last year than they did the year before.

Representing 22% of the survey sample, dealers, distributors, and commercial oems did better, actually increasing the average value of the systems they sold by $2,085. Software distributors and oems, 20% of those surveyed, raised the value of their products by $160.

SAME STATES IN LEAD

The geographic distribution of those surveyed remained the same at the top from one year to the next, with California holding on to 18.1% of these oems and vars. New York kept its number two position, with 9% of these firms calling the Empire State home. Massachusetts slipped to fifth place from third, hanging on to 5% of the resellers polled, while Texas took over as number three with 6.2% and New Jersey came in fourth with 5.4%.

In general, the Midwest and Mid-atlantic posted losses of oems and vars. Among these states are Virginia, Maryland, Pennsylvania, Ohio, Illinois, and Minnesota. Florida showed a gain—to 4.5% of the companies surveyed in 1985 from 3.2% in 1984.

In still another measure of the health of the oem market, the rate of new resellers entering the field remains low. Despite the larger sample size, fewer new companies started up in 1985 than in the previous nine years. Only 162 firms were formed last year. Further, the rate of expansion for this segment of the industry has dropped steadily to 4% today from a high of 20.2% in 1978.

The survey's assessment of systems houses and oems by size suggests that much of the increase in the database is in small companies with sales under $10 million and staffs of 50 or fewer employees. Nearly 92% of the firms in the survey sample report revenues of less than $10 million, and 88.5% have staffs of 50 or less.

In fact, the greatest growth in the industry, according to the survey, is in firms earning $1 million or less annually. The number of companies in this category grew to 58% from 46%. Oems and vars in the $1.1 million to $10 million category and in the $10.1 million to $100 million category lost 5.2% and 6.8%, respectively.

Over half of the survey sample (55.2%) have 10 or fewer employees. Another 23.3% of the sample have between 11 and 25 employees.

An examination of the end-user markets served by oems and vars shows a rise in the number of these companies selling to the construction industry, to 7.3% in 1986 from 3.4% in 1985. Similarly, finance, insurance, and real estate markets were customers of 11.3% of the resellers in last year's survey, compared with 17.2% this year.

Downturns appear in the number of oems and vars selling to manufacturers (to 14.3% from 19.4%), retailers (to 6.7% from 9%), and public administrators (to 3.5% from 6%). Services also fell sightly, to 31% from 34.3%.

Again, all of these data must be

Bridalveil Fall, Yosemite National Park, California c. 1927
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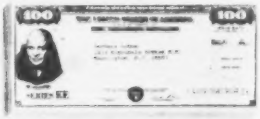

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FIG. 1
MINICOMPUTER SALES VIA OEMS

MANUFACTURER	PERCENT SHARE OF MINICOMPUTERS SOLD VIA SYSTEMS HOUSES/OEMs				
	1981	1982	1983	1984	1985
ADDS	—	—	—	—	1.3
AT&T	—	—	—	—	1.9
Burroughs	—	—	—	—	1.1
Data General	21.5	11.5	6.1	3.4	4.3
Datapoint	4.2	4.1	3.0	1.3	1.1
Digital Equipment	48.4	42.8	28.4	39.4	28.9
Hewlett-Packard	6.0	7.2	3.9	1.6	3.3
IBM	3.2	4.7	14.5	28.4	31.0
Motorola/Four Phase	—	—	—	—	2.4
Prime	1.5	11.0	1.4	1.6	2.0
Sperry Univac	—	—	—	—	1.1
Texas Instruments	1.8	5.5	2.3	3.8	6.0
Wang Laboratories	—	—	3.9	3.1	1.7
All others	10.9	11.8	26.9	14.9	13.9
Total Sample (units shipped)	**14,463**	**13,440**	**20,424**	**40,567**	**34,084**

FIG. 2
PERSONAL COMPUTER SALES VIA OEMS

MANUFACTURER	PERCENT OF PERSONAL COMPUTERS SOLD VIA SYSTEMS HOUSES/OEMs				
	1981	1982	1983	1984	1985
Altos Computer	—	4.9	4.6	3.2	5.3
Apple	37.9	20.3	4.9	7.1	6.6
AT&T	—	—	—	—	3.6
Atari	—	—	—	—	2.1
Bondwell	—	—	—	—	2.5
Columbia	—	—	—	—	1.0
Commodore	6.5	5.4	10.3	10.0	1.8
Compaq	—	—	—	—	3.2
Convergent Technologies	—	—	—	—	1.4
Corona Data Systems	—	—	3.5	2.2	1.9
Cromemco	2.1	2.4	4.9	2.4	1.1
Digital Equipment	—	1.0	11.4	6.2	2.9
Hewlett-Packard	—	—	1.0	1.1	1.3
IBM	3.7	11.3	9.1	21.4	32.8
ITT Information Systems	—	—	—	—	1.8
Leading Edge	—	—	—	—	1.6
Sanyo	—	—	—	—	1.8
Sperry Univac	—	—	—	—	1.1
Televideo	—	3.5	8.5	4.9	4.0
Texas Instruments	—	3.3	4.3	5.7	1.4
Wang Laboratories	—	—	—	4.0	1.1
Wyse Technology	—	—	—	—	1.1
Zenith	—	—	—	1.2	5.2
All others	40.9	36.2	21.1	12.8	13.4
Total Sample (units shipped)	**21,750**	**36,792**	**67,732**	**115,007**	**197,346**

evaluated with care, since this year's survey includes many new end-user markets not covered before. No less than 37 of the 77 listed industries are new.

Because more than twice the number of companies responded to Technical's survey in 1985, it is not possible to determine either the fastest-growing or fastest-shrinking end-user markets. Overall, however, general business/accounting and specialized business/accounting applications account for fewer of the total systems sold last year than they did the year before (see Fig. 3), yet they still account for nearly

Biggest news of the survey is the 10-point drop in Digital's share of the oem minicomputer marketplace.

half (46.2%) of all applications. Some of this drop may be owed to the bigger survey base and the addition of new group and subgroup categories not included before, such as the scientific and systems tools listings.

Together with office automation applications, business and accounting are still on top (see Fig. 4). Gains for office automation may reflect the fact that word processing is finally being implemented by big corporations. The drop in earth resources applications may reflect the problems being experienced by the oil industry.

Perhaps the biggest news from this year's survey is the 10-point drop in Digital Equipment Corp.'s share of the oem minicomputer marketplace, despite the increased sample size (see Fig. 1). In the meantime, IBM's market share rose three points to take first place with 31%.

The oem minicomputer game still belongs to these two vendors, however. The survey shows a minor reshuffling in rank for the other manufacturers of these computers. Texas Instruments is Digital Equipment's and IBM's nearest competitor with a 6% share of the market. Wang Laboratories' share dropped by nearly half to 1.7%.

IBM continues to lead in microcomputer sales to oems and vars, as well, expanding its market share to 32.8% in 1985 from 21.4% in 1984 (see Fig. 2). Zenith is the only other company to post an increase in share—to 5.2% from 1.2%. Zenith's performance may be owed in large part to the massive federal government contracts it has won in the past three years.

The 11 companies new to the list of oems and vars selling personal computers—among them AT&T, Compaq, and Leading Edge—managed to capture 21.2% of this market in 1985. All told, they sold more than 41,000 systems, enough to rouse IBM: recent IBM product introductions, notably the 286 XT, confirm the impression that the clone makers have captured Big Blue's attention.

FIG. 3
TOTAL VAR MARKET BY BROAD APPLICATION CATEGORIES—1985

MARKET	PERCENT OF TOTAL SYSTEMS SHIPPED			
	1982	1983	1984	1985
General Business Accounting	35.58	28.04	31.47	16.39
Specialized Business Accounting	27.22	23.67	23.46	15.83
Office Automation/Productivity	8.69	7.80	8.25	9.78
Manufacturing Production	11.81	14.03	13.42	13.20
Industrial Automation	4.88	6.40	4.86	4.25
Design Automation	.75	.99	1.13	3.84
Earth Resources	2.09	1.66	1.87	1.55
Scientific	*	*	*	2.92
Real-Time Data Acquisition & Control	2.22	2.53	1.89	3.51
Graphics	1.58	2.04	1.98	3.20
Communications	6.73	7.71	6.67	11.65
Health/Medical Services	.41	1.97	.88	2.84
Laboratory	1.67	1.53	1.39	2.29
Computer Aided Publishing	.32	.34	.35	1.77
Systems Tools	*	*	*	4.39
Other Applications	2.05	2.29	2.38	2.59
Total Systems	**171,236**	**171,842**	**155,574**	**233,893**

*Not included in previous years

FIG. 4
TOP APPLICATIONS FOR VARS—1985

APPLICATION	1985 UNIT SHIPMENT
Word Processing	308,242
General Ledger	305,654
Accounts Receivable	302,482
Accounts Payable	300,582
Billing/Invoicing	295,028
Payroll	292,099
Database Management	291,743
Order Entry	289,181
Spreadsheets	274,047
Sales Analysis/Forecasting	264,133
Integrated (wp, DBMS, ss)	246,009
Electronic Mail	230,563
Graphics	228,404
Management Information Systems	222,951
Inventory Control	213,966

SEVERAL NEW FIRSTS

In addition to the doubled database, this year's survey includes several other "firsts"—answers to questions that haven't been asked before in the eight-year history of the systems house and computer oem directory. Asked to classify the systems they sold in 1985, for example, a healthy majority of the 4,256 companies responding (61.3%) list multiuser and standalone microcomputers.

This figure lends weight to the generally accepted notion that the third-party channel is, first and foremost, an outlet for micros. These data also may reflect the increasing focus of the entire industry on the desktop. Less than one third of the surveyed firms sold anything bigger. Only 15.6% of these companies indicate they sold minicomputers, and just 11.7% report sales of superminis.

Technical workstations, too, have yet to be marketed in a big way through this channel; only 8.3% of the oems and vars polled sold them. Similarly, at the low end of the spectrum, just 3.1% of the responding companies say they market board computers.

When asked—for the first time in the directory's history—to describe the systems they sold last year, the responses of those surveyed form a pyramid. Corporate resource computers serving more than 128 users and costing in excess of $1 million are at the top, and work group and single-user

FIG. 5

PERIPHERALS SALES VIA OEMS

TYPE OF PERIPHERAL	QUANTITY SOLD VIA OEMS 1982	1983	1984	1985	% CHANGE
PRINTERS					
Serial: Dot matrix	68,994	82,999	120,747	363,757	+ 201.3
Serial: Daisy, thimble	20,524	25,761	45,713	64,747	+ 41.6
Serial: Ink jet	*	*	*	30,139	NA
Serial: Thermal transfer	*	*	*	18,903	NA
Serial: Direct transfer	*	*	*	6,142	NA
Line: Thermal transfer	*	*	*	199	NA
Line: Dot matrix	*	*	*	26,187	NA
Line: Fully formed	*	*	*	11,524	NA
Page printers (laser, LED, LCS)	*	*	*	116,590	NA
Teleprinters	19,403	14,830	21,586	6,028	- 72.1
Plotters: A4, B4 size	*	*	*	7,903	NA
Plotters: Oversize	1,205	3,093	2,319	1,421	- 38.7
GROUP TOTAL	**110,126**	**126,683**	**190,365**	**653,540**	**NA**
DISK DRIVES					
3½-inch floppy diskette drives	—	—	34,614	70,827	+ 104.6
5¼-inch floppy diskette drives	—	—	92,388	398,560	+ 331.4
8-inch floppy diskette drives	*	*	*	27,424	NA
5¼-inch Winchester drives	*	*	*	86,713	NA
8-inch Winchester drives	8,423	6,843	15,584	14,838	- 4.8
14-inch Winchester drives	3,690	4,671	4,594	4,701	+ 2.3
Disk emulators	*	*	*	1,615	NA
Fixed disk drives	3,675	4,466	18,349	37,903	+ 106.6
Removable disk drives	8,958	7,610	19,234	31,226	+ 62.3
GROUP TOTAL	**83,549**	**94,588**	**184,763**	**673,807**	**NA**
TAPE DRIVES					
Cassette/cartridge drives	6,708	8,106	10,454	47,484	+ 354.2
Reel-to-reel drives	4,296	6,463	6,256	65,460	+ 946.4
GROUP TOTAL	**11,004**	**14,569**	**16,710**	**112,944**	**+ 575.9**
CRT TERMINALS/MONITORS					
Alphanumeric, monochrome	*	*	*	242,394	NA
Alphanumeric, color	*	*	*	37,231	NA
Graphic, monochrome	*	*	*	72,881	NA
Graphic, color	*	*	*	36,849	NA
GROUP TOTAL	**—**	**—**	**—**	**389,355**	**NA**
MODEMS					
Limited distance	*	*	*	67,969	NA
Voiceband	*	*	*	52,416	NA
Wideband	*	*	*	15,962	NA
Acoustic couplers	*	*	*	7,708	NA
Fiberoptic	*	*	*	2,049	NA
GROUP TOTAL	**—**	**—**	**—**	**146,104**	**NA**
CONVERTERS					
Protocol	*	*	*	4,718	NA
Interface	*	*	*	11,763	NA
Code/speed/mode	*	*	*	364	NA
Terminal emulators	*	*	*	22,170	NA
GROUP TOTAL	**—**	**—**	**—**	**39,015**	**NA**
OTHER *					
Memory expansion boards	14,643	7,558	31,276	172,763	+ 452.4
Multiplexors	*	*	*	109,386	NA
GROUP TOTAL	**14,643**	**7,558**	**31,276**	**282,149**	**NA**

*Not included in previous years
NA: not available

Unix's still-tarnished image in the marketplace may remain less than sterling.

computers supporting between one and 10 users and selling for $5,000 to $25,000 are at the bottom.

Just 3.4% of the oems and vars sold big corporate resource computers, while 59.1% of these companies marketed their solutions to single users and work groups of two to 10.

Vars and oems selling 11- to 20-user departmental computers for between $25,000 and $75,000 comprise 19.8% of the sample. Next up the pyramid are the 11.3% of those surveyed who sold large department computers aimed at between 21 and 64 users and priced between $75,000 and $250,000, followed, on top, by the 6.4% who sold business unit computers for groups of 65 to 128 users and at a cost of $250,000 to $1 million.

Again, the emphasis in the systems house/computer oem market is on small systems for small groups of people. The survey data also suggest that this is an industry of small businesses that sell to small business.

In other firsts, the directory's oems and vars were asked to specify the I/O bus standards and operating systems that their products support. At least seven firms are contenders in the race for most used I/O bus standard.

S-100 BUS STANDARD IN LEAD

The S-100 bus standard currently holds the lead with the commitment of 16.6% of the responding companies, followed closely by the STD standard at 14.5%, Multibus-I at 13.3%, and Q-bus at 12.4%. The VME standard has the support of 6.4% of those surveyed, while Versabus is at the bottom of the heap with 1.6%. Another 28.5% of the oems and vars adhere to "other" standards not listed by name in the survey questionnaire.

Together, MS-DOS and PC-DOS, the Microsoft Corp. operating system for microcomputers and its IBM PC incarnation, are sold and supported by nearly half (48.1%) of the 4,256 companies covered in the survey. CP/M continues to have a presence in the oem/systems house market with a 12.4% share of these firms.

AT&T's Unix operating system, meanwhile, is used in some form by 21.8% of the responding vars and oems. Its still-tarnished image in the marketplace may remain less than sterling, however, so long as its total market share is divided among Unix bsd 4.2 (3.3%), Unix Systems III and V (9.0%), and Microsoft's Xenix (9.5%).

For the first time, Technical Publishing tried to assess software purchases by the oems and systems houses in its database. As expected, the data show this field to be hotly contested. The industry leaders—Microsoft, Lotus Development Corp., and Ashton-Tate—are on top in that order with less than 5% of the market each. Here, IBM holds a 2.9% oem market share, behind Softsel (3.6%), MicroPro (3.2%), and MBSI/Realworld (3.0%).

The oems and vars surveyed sold nearly 2.3 million peripheral devices in 1985 (see Fig. 5). Once again, however, comparisons with 1984 data must be made carefully, considering the expanded survey sample.

In addition, comparisons to past years are often not possible at all. As with end-user applications, many new peripheral categories are tracked that were not in-

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CIRCLE 74 ON READER CARD

The oems and vars surveyed sold nearly 2.3 million peripheral devices in 1985.

cluded before, like modems and converters.

Out of 2,296,914 peripheral devices sold in 1985, disk drives top the list at 673,807 units, followed by printing devices at 653,540 units. The data suggest that the products to watch in these categories are 3½-inch floppy diskette drives and page printers, whether laser, LED, or LCS.

Oems and vars report they sold 70,827 of the 3½-inch drives and 116,590 of the page printers last year, perhaps reflecting the personal computer industry's move to the smaller drive and the promise—if not yet the reality—of desktop publishing. Meanwhile, the market for plotters, dominated by Hewlett-Packard, is plunging, a fact unmitigated by the survey's doubled sample size.

Shugart lost more than half of its 1984 29.6% share of the 3½-inch floppy drive market to several new players, including Canon, Fujitsu, Sony, and 3M. Apple now leads the field with a 14.9% share, although it fell five percentage points between 1984 and 1985. Texas Instruments commands the page printer market with an 86.5% share. The company's nearest competitor in this field is Hewlett-Packard with a 4% share.

The industry workhorses in the printer and disk drive categories—the serial dot matrix printer and the 5¼-inch floppy diskette drive—continue to dominate their fields, posting 1985 oem/var sales of 363,757 units and 398,560 units, respectively.

Okidata is king in dot matrix printers with a 45% share of the market. The company leads several other printer categories in the survey, too, including serial thermal transfer printers, where it has 79.4% of the market, and line thermal transfer printers, where it boasts a 38.2% share.

Olivetti has a firm hold in 5¼-inch diskette drives, meantime, with a 25.1% market share. Otherwise, both the dot matrix printer and 5¼-inch diskette drive markets are quite fragmented among several contenders, with a number of firms posting an oem market share for the first time in 1985.

Monochrome devices still comprise the bulk of oem/var crt terminal and monitor sales. The combined total of quantities sold in 1985 for alphanumeric color and graphic color terminals and monitors—74,080 units—doesn't even begin to approach the 242,394 alphanumeric monochrome displays sold.

The big player in this sizable market is Wyse with a 35.7% share. Wyse's nearest competitor in alphanumeric monochrome devices is IBM with 10.7% of the market. The market for color alphanumeric terminals and monitors is led by Thomson with 18.8%, followed by DEC with 10.1%. Thomson dominates the graphic color terminal and monitor market too with a 13.6% share.

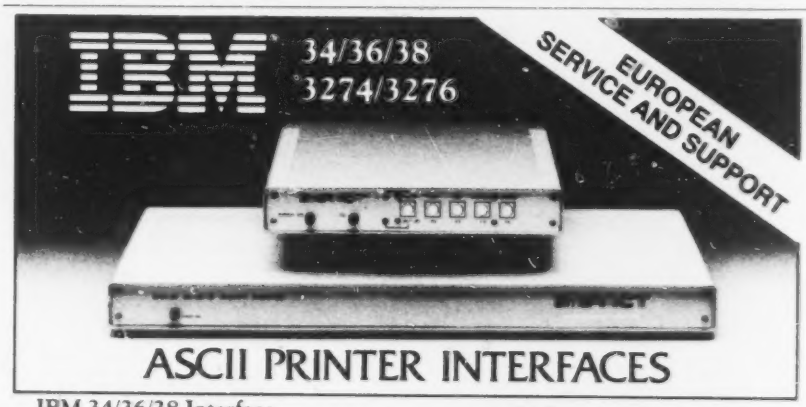
The modem and converter categories are driven by their standard product offerings, as well. Limited distance and voiceband modems (totaling 120,385 units last year) and terminal emulators (at 22,170 units) lead oem/var peripheral sales in these areas.

Not surprisingly, Hayes is the name to know in modems with a 20.9% share of the limited distance market segment and a 16.4% share of the voiceband segment. Hard on Hayes's heels in voiceband modems, however, are Anchor Automation with 14.8% of the oem market and Racal-Vadic with 14.7%. DCA comes out on top in terminal emulators with a 27.5% market share, as it does in protocol converters with 24.1% of the field.

As in the past, memory expansion boards continue to sell briskly. Some 172,763 units were peddled by resellers in 1985. In this area, AST Research continues to be the primary oem vendor with an 18.7% market share. Its closest competitor is Quadram with 7.1% of the oem market.

Like so much of the industry, oems and vars clearly felt the continued slump in the market for computers during 1985. While the number of companies polled went up, the total value of the systems they sold went down. IBM's performance in micros and minis and the continued strong showing of leading oem vendors in other product segments, however, indicates that the reseller market is stable. From such a base, oems and vars stand a better chance of benefiting from the upturn when it comes. ◉

The three-volume *1986 Directory of Systems Houses and Computer Oems* lists 4,256 companies in alphabetical order, by location and oem/var category, by applications offered, as well as by cpu vendors and types of peripherals sold. Priced at $795, it is available from Technical Publishing Co., 199 Wells Ave., Newton Centre, MA 02159, (617) 964-8890.



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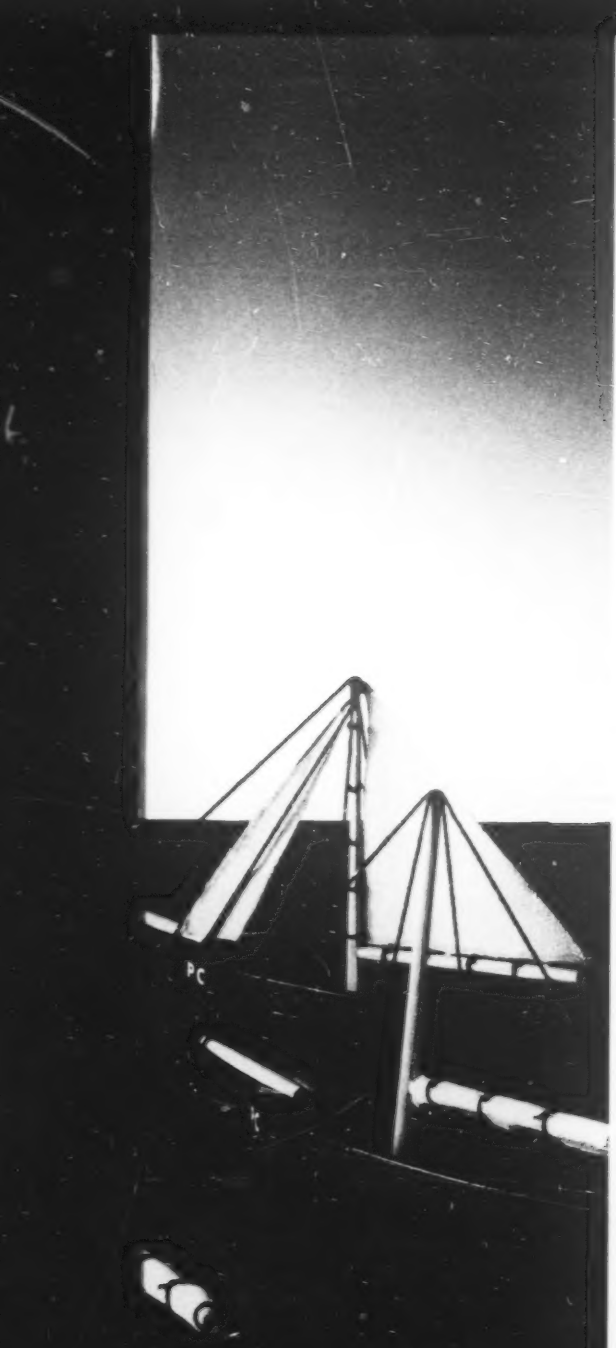


Departmental computers are destined to become the shippers of corporate information and other resources.

NEW PORTS OF CALL

by George F. Colony

With the mainframe and personal computer marketing games virtually over and won by IBM, the user focus in large companies has shifted to networks of midrange systems. These medium-sized computers will be the bridge between the microcomputer and the mainframe. Ultimately, they will become a means of harmonizing large populations of pcs with corporate information, especially centralized databases.

Some have argued that departmental computing is little more than rehashed distributed data processing—that tarnished icon of the late '70s. Yet the primary force fueling the departmental computing drive is the pc, which was certainly not around in the days of distributed dp. Today, micro users are beginning to demand integration—integration that enables their desktop machines to tap into corporate resources including databases, networks, and server-based software.

Departmental computing will be the best means of delivering that pc integration. In this computing context, departmental systems will act as pc "servants," doling out resources such as software and database information to micros on demand. These systems can thus be thought of as departmental resource processors (DRPs). The DRP is not a traditional timeshared minicomputer. It is an evolved version of the mini, cast in the new role of pc servant.

At a minimum, the DRP is a 32-bit, multitasking engine. Simply stated, it sits in the intermediate space between the microcomputer and the host, acting as a gateway from the department to mainframe. It bridges laterally to other departments on a peer-to-peer basis and also controls department resources such as databases. The DRP balances shared data such as corporate information with personal data like a Lotus 1-2-3 spreadsheet.

Few, if any, terminals attach to the DRP. Micros are connected over a high-speed local area network to the departmental computer. In addition to the evolved minicomputer, the DRP engine could also be a PBX/hybrid à la the Northern Telecom (Mississauga, Ont.) Meridian/DV-1; an advanced file server with communications and database like Westboro, Mass.-based Banyan System Inc.'s Virtual Network System; or a specialized system like Los Gatos, Calif.-based Britton Lee Inc.'s database server.

In its role as pc integrator/slave/adjunct, the departmental resource processor will provide the following functions to micro users:

- Communications control: linking with a diverse set of nodes within the corporation, such as the host computer, and with the outside world through public databases like Dow Jones;
- Distributed databases: the local database running on the DRP will be closely tied to a superset version at the mainframe and to an individual version located on the pcs;
- New generation of office systems: providing decision support, text filing, and group scheduling through polled pc-based calendars;
- Pc software distribution: provided from the mainframe to the DRP and down to each pc, which eliminates costly manual software administration and distribution;
- Support for departmental, vertical applications: as the minicomputer grows into its DRP role, it must continue to run such embedded applications as order entry, general ledger, and word processing.

FOUR BASIC BENEFITS

From a user standpoint, the DRP has four basic benefits. First, it provides access to a wide variety of corporate information. Second, DRP implementation parallels corporate structures that are based around departments. The departmental computer also satisfies a user's psychic need for independence. Finally, DRPs give middle management a more active role in technology management.

Personal computers appeal to U.S.

PHOTOGRAPH BY WALTER WICK

It remains to be seen whether IBM's 9370 will break DEC's lock on the DRP market.

corporate users because the machines stand alone, unencumbered by the scrutiny or formal rules of the MIS department. Presented within this framework, pcs pose a minimal threat to the status quo.

Over the past two years, micro users have demanded to be assimilated into the corporate information structure. The fast growth in the installation of 3270 emulation boards attests to this. New user networking requirements have reached a critical mass as personal computer populations have expanded at the departmental level (see Fig. 1).

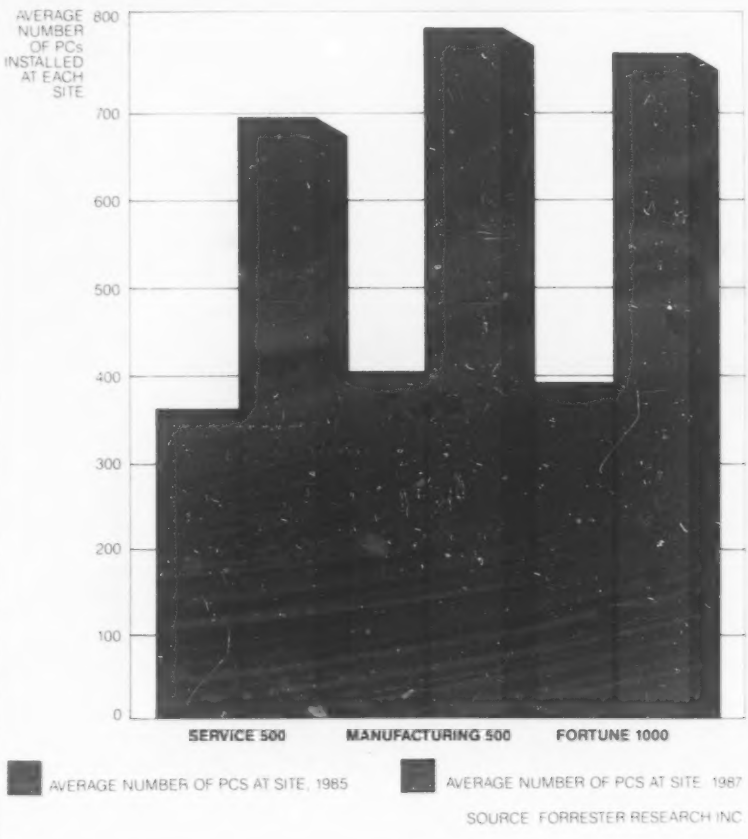
The primary raison d'être for departmental computing is its promise of improving company communications. The obvious tool for making that improvement is the microcomputer, which is underutilized in many firms. Users looking for a way to leverage their pc investments are prime candidates for DRP. Integration by means of a DRP would extend micro muscle by giving users a way to share files easily without having to move diskettes around manually, thus eliminating "sneakernet." Users would also have a means of linking with and building departmental databases, giving users access to reports and correspondence that were formerly stuck away in file cabinets or buried in an unwieldy MIS "green bar" report. In addition, departmental processing provides more efficient use of pc software by tightly coupling it with the DRP database.

Departmental resource processing closely matches the organizational structure within large companies. This can be determined by examining the type of information pc users in those companies want to access. An informal survey by Forrester Research Inc., Cambridge, Mass., found that 60% of that information is located within the user's department, 25% is somewhere else in the user's site, 10% is at a remote location in the company—most likely in a mainframe—and 5% is in a public database like Dow Jones.

Micro-to-mainframe links assume that pc users are oriented to host-based information. Unfortunately, this approach overlooks the critical mass of information that is contained at the department or work group level. With micro-to-mainframe connections, intradepartmental correspondence must go "around the horn" to the mainframe to reach a nearby desk.

The micro-to-mainframe route also puts end users right back in their predicaments of old—being subject to the whims, rules, and backlogs of centralized, mainframe/batch-oriented MIS management. The DRP, on the other hand, meets users' psychic requirements for autonomy. They can set their own priorities and manage information based on departmental timetables and, even more important, they don't have to fight with the MIS department to get their work done. The DRP gives user departments the independence to own and ultimately control their own data, free of the corporate demands placed on that information.

FIG. 1
AVERAGE NUMBER OF PCS INSTALLED



SOURCE: FORRESTER RESEARCH INC

PROBLEMS STILL TO BE SOLVED

While distributed resource processing offers much promise for the future, there are still problems—technical as well as nontechnical—that must be resolved before the concept can be successfully implemented. These problems come in the four main areas of security, distributed database, incompatibility, and organizational resistance. On the security side, the distribution of data among many departmental computers will make it far more difficult to track, manage, and protect sensitive information. In the end, securing data that are fragmented on many departmental systems could become the most critical factor blocking full implementation of DRP.

There are other distributed database concerns as well. To make DRP work, databases must be divided into three parts: one small portion at the pc, a departmental version at the DRP, and a corporate superset at the mainframe. This type of fragmented database is not currently available, except in a more general form in the Focus software from Information Builders, New York.

The incompatibility issue is the third trouble spot. PC/DOS, minicomputer operating systems like VMS, and mainframe systems like MVS share no compatibility. These big differences between machines will hamper the cooperative relationship

envisioned by distributed resource processing. Attitudes inside the user organization could also stymie the development of DRP. At the end user's end, micro managers may protest because they'll feel that departmental processing will erode their hard-won autonomy from the MIS department. MISers wedded to the IBM way may fight DRP because Big Blue's offerings in this area are weak.

RULES OF GAME WILL CHANGE

There is no doubt that departmental computing will change the rules of the game for IBM and other systems suppliers such as Digital Equipment Corp. and Wang. The old image of the minicomputer as a timeshared facility will have to be discarded in the new era of departmental computing. Terminals will become much less important and vertical solutions/software will have to be reconfigured to fit with distributed database and other DRP-based systems.

To get an idea of current positioning in the DRP market, Forrester conducted a survey of 300 Fortune 1000 companies, asking them to rate 20 vendors as providers of pc integration products. The respondents to the survey were primarily high-level computer, office automation, or communications planners who had such titles as director of data processing, director of MIS, and director of communications. The survey results are shown in Fig. 2.

The vendors in the DRP market can be divided into four groups: the Leader, the Challengers, the Longshots, and the Burnouts. There's no surprise who's leader of the pack. Despite its continuing problems at the midrange level, IBM is still perceived to be the primary vendor to large users. IBM's 4.41 score was much better than its nearest competitors, Wang and Digital Equipment, each of which had a 2.33 rating. The company's continuing support from users will give it time to regroup its midrange efforts for a full frontal assault on Digital. IBM's salient weapon? It's a scaled-down 4300.

Next come the Challengers, headed by DEC. The company's micro integration rating is surprisingly low. Digital's recent moves to improve pc attachment to its VAX line, including offering DOS services under VMS, should make the company a closer competitor to IBM in the short term.

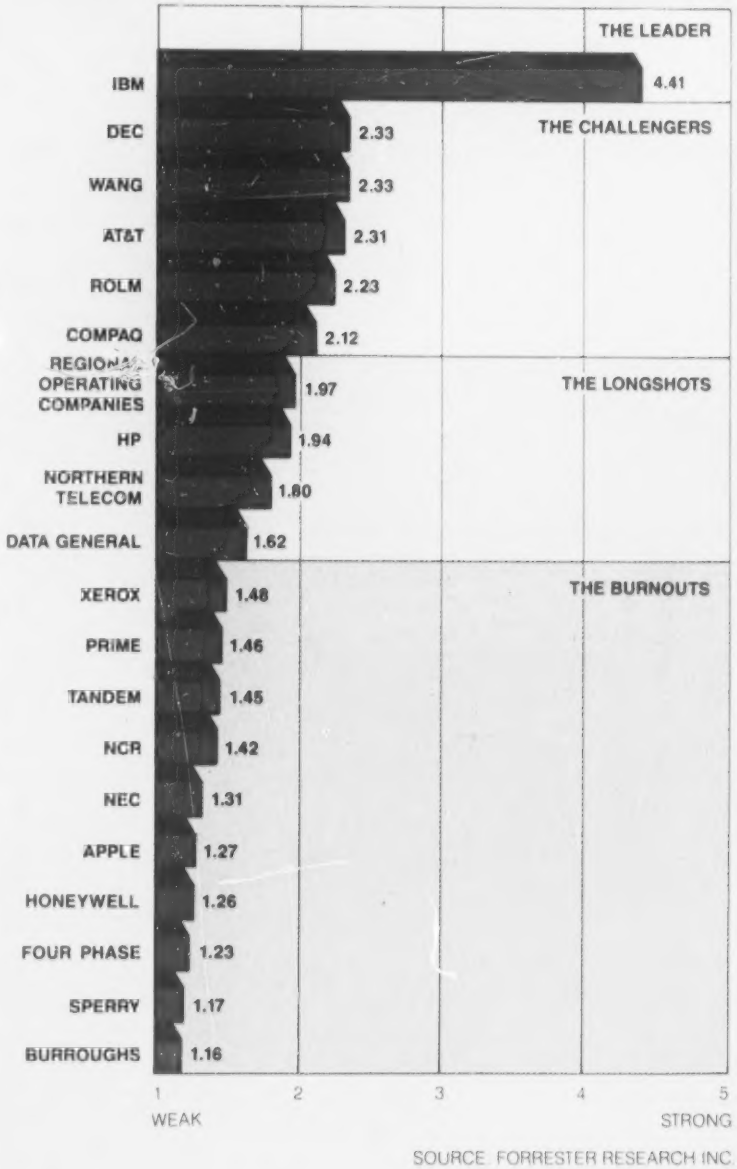
In spite of recent difficulties, Wang has held onto the confidence of its customers. If its problems persist, however, Wang can be expected to quickly fade into the league of Longshots. Ranking very close to both DEC and Wang is AT&T. While AT&T continues to lose an unprecedented amount of money in its attempts to crack the computer business, the company still scores relatively high grades from users.

Rolm rated well because it was able to ride on IBM's coattails. In fact, a number of survey respondents directly equated Rolm with IBM, grading the PBX vendor accordingly. Last but not least comes Houston-based Compaq, the most surprising member of the Challengers. The company's good user rating is an indication of its strength as a pc supplier to the Fortune 1000.

There are four companies in the Longshots list. First come the regional operating companies, which are the wild cards in the DRP market. Then there's Hewlett-Packard, which offers a rich mix of departmental products. Nevertheless, the California company's sales force continues to be oriented toward the scientific/engineering environment.

Northern Telecom also has some marketing problems. The firm's DV-1, which is conceptually targeted at the departmental computing domain, has users confused about whether the system is really a small PBX or a pc integration vehicle.

FIG. 2
USER RATING OF VENDORS AS PC INTEGRATION PROVIDERS



SOURCE: FORRESTER RESEARCH INC.

If IBM does not strike back with a viable midrange offering, DEC will have a lock on the DRP market over the next two years.

Next comes Massachusetts mini maker Data General. On the departmental scene early with its CEO system, DG has not followed through with a complementary pc integration strategy.

The Burnout companies have seen their fortunes with the Fortune 1000 ebb and flow. Xerox, Prime, Tandem, NCR, NEC, Apple, Honeywell, Four Phase, Sperry, and Burroughs have been relegated to filling niches or trying to hold on to their limited installed bases. Forrester sees Xerox, NEC, NCR, and Prime as the only vendors capable of boosting themselves into the ranks of the Challengers.

The Challengers, of course, are all IBM's closest rivals. That closeness is a function of IBM's strength, which will be greatly enhanced if it can get its act together at the midrange level. In that case, the mighty company's domination of the microcomputer and mainframe markets would act as a pincer against other DRP suppliers. It remains to be seen whether IBM's new midrange offering—the 9370, unveiled in October—will be enough to break Digital Equipment's current lock on the DRP market.

AT&T, Data General, Wang, Hewlett-Packard, Prime, and Northern Telecom could also emerge as important players in the departmental computing realm. Other companies such as NEC, NCR, and Sperry must hit a home run if they hope to avoid niche roles in the Fortune 1000 firms.

In those top firms strategies for harmonizing pcs remain elusive. The relative immaturity of IBM's token ring network and the failure of the System/36 as a pc integration vehicle have hampered the harmonization effort. So have minicomputer vendors that have come up with unfocused solutions to the problem. The high cost/low functionality of micro-to-mainframe links has also not helped users in their quest for pc harmonization.

What could help users in that quest is the departmental computer, which will be the key to tying pcs with corporate networks. That bridging function will be just one of the chores performed by the DRP. In fact, the greatest strength of the DRP is its ability to play many roles, evolving over time from a cost-effective local processor into a pc servant/communications hub.

The departmental computer will have a broad impact on how medium-sized and large-sized companies manage technology. In the future, central information resources that are based around the mainframe will be pushed out into departments. As a result, the central site will lose some programmers and operations personnel, who will be moved out to maintain and manage departmental computers. A part of the central database will also be transferred into departmental systems that are closer to users. In addition, some end-user applications development will be distributed.

The host will play a diminished role as peer-to-peer networks proliferate. Mainframes, however, will not go away. The host will continue to run large transaction processing systems, applications that require a high level of security, and some jobs that lend themselves to centralization such as corporate ledgers. Mainframes will also carry the corporate database, acting as the main repository for information distributed in departmental computers.

As resources become more highly distributed in Fortune 1000 companies, a new model of information management will be required. In this new management mode, centralized, vertical information management will flatten out, becoming more horizontal in structure. The MIS department will have less of a direct role in equipment acquisition. Instead, it will become more of a consultative entity, setting broad strategic goals for the company. Direct control of information systems will be transferred to "mini-MIS" organizations in departments or at sites.

Under this envisioned management model, the MIS department will set standards for a top-down architecture. This architecture will likely include IBM's SNA and DISOSS, database standards, and other broadly defined resources. Meanwhile, the mini-MIS operation, functioning as a grass roots group, will define bottom-up requirements such as pc/DRP applications, local databases, and local area networking.

These bottom-up requirements would interlock with the top-down architecture. Also, in most companies, the top-down architecture will, to a certain extent, channel the general direction of bottom-up requirements. Nevertheless, the MIS battle plan must still be flexible and responsive to end-user needs.

Answering those needs is crucial, because ultimately only end-user departments can understand how computer and communications systems can be used to gain a specific competitive advantage. In this sense, mini-MIS will guide the tactical use of technology inside the corporation. The MIS department will then become the corporate technologists, ensuring that the strategic technology plan squares with the corporate strategy. They may also manage what's left of that vestige of the '70s—the mainframe. ◉

"None for Richard. Alcohol activates his reptilian brain."

CARTOON BY MICK DOWNS

An analyst in office systems and communications, George F. Colony is president of Forrester Research Inc. in Cambridge, Mass.

A new survey says the end-user revolution is over; the action has moved to other battlefields.

MIS RATES THE ISSUES

by Martin Herbert and Curt Hartog

What are the key issues facing MIS managers? What are the major effects of the rapid increase in end-user computing? To find out, the Center for the Study of Data Processing (CSDP) of Washington University, St. Louis, in conjunction with DATAMATION conducted a survey of Fortune 1000 companies throughout the U.S.

The results of the survey are quite diverse, but two conclusions stand out. The end-user "revolution," as seen by MIS managers, is over, and a counterrevolution aimed at winning the hearts and minds of top management has begun. The three top-rated issues—alignment of MIS with business goals, data utilization, and education of senior personnel—portray a major repositioning of MIS management attitudes. Gaining control of end-user computing now appears less important than demonstrating to top management the value of a responsive MIS in accomplishing business goals.

These are the key findings from a two-part questionnaire sent to 1,500 managers identified as "key man on-site" in their companies. Six hundred questionnaires were returned—a solid response rate of 40%. Within the survey population, manufacturers were most heavily represented (42%, about one third of whom were computer manufacturers). Finance, trade, utilities, and government were each represented on from 8% to 12% of the questionnaires returned.

Although the companies were large—half of them had billion-dollar sales or revenues—50% of all respondents (and 40% from the billion-dollar companies) worked at sites with no more than 20 dp employees. About half reported that their companies had chief information officers (cios) or their equivalents.

The overall rankings from the 23 questions comprising the first part of the questionnaire are represented in Fig. 1.

The significance of alignment's number one position cannot be overstated. At a time when competitive pressures are squeezing many organizations and forcing cuts of personnel and unproductive business units, MIS managers are shifting their horizons from technical management and planning to the business objectives defined by top corporate leadership.

Somewhat surprisingly, the second-highest rating went to data utilization. On first glance, the importance of this rather narrow and technical issue is not apparent. Yet, in conjunction with the high ranking of alignment, the overall sense is clear. Alignment means assuring that data are made available to the right person in a timely manner, the crux of data utilization. From another angle, data utilization is both the goal of alignment and the means to increase it.

The third-ranked issue, educating senior personnel, follows the same pattern. Its intrinsic value is not obvious, but, given the number one and two rankings of alignment and data utilization, the importance of communicating MIS's role and its potential contribution to senior management makes sense.

Increasingly, MIS management seeks to coordinate key decisions about information technology with corporate strategic and tactical objectives. For example, in converting from DOS to MVS, many MIS managers may focus on discovering corporate strategic plans in order to inform management better about the business consequences of the conversion.

STRATEGIC VIEW OF MIS

Taken together, the three highest-ranked issues comprise a strategic view of an MIS function more oriented toward business objectives. MIS managers, traditionally viewed as good technical leaders, indirectly portrayed themselves in the survey as being (or wishing to be) part of the top corporate management team. Hence, the top issues reflect an emphasis on MIS effectiveness instead of efficiency.

Despite this strategic sense of their mission, respondents predictably ranked software development and productivity very high (fourth and fifth, respectively). Software development is MIS's traditional bread and butter role, the activity that, for better or worse, characterizes dp to the rest of the corporation. Productivity focuses mainly on how well MIS performs that software development role.

In fact, the emphasis on software development productivity overlaps one aspect of the current strategic emphasis: responding quickly to changing business needs. The combination of intense competitive pressures and the availability of information technology in user departments makes business managers less inclined to queue up for new, MIS-developed systems—to become part of the backlog. In turn, politically savvy MIS managers are seeking major improvements in productivity.

In any case, the five highest-rated issues reveal two patterns: a strategic focus on top management and a traditional emphasis on building information systems. Planning, ranked sixth, lends itself to both.

Three of the four issues that round out the top 10 suggest another grouping: integration of technologies, telecommunications technology, and office automation. Together, these illustrate the growing role of information technologies outside of the traditional MIS shop and the backbone role of telecommunications in distributing the benefits of automation.

A major surprise is the absence of end-user computing (ranked 12th) from the top group. Comments made in the second part of the questionnaire do not suggest that all the problems are solved, but that opinion about the impact of end-user computing is divided.

The lower-ranked issues fit into four categories: narrowly focused items, such as CIM, centralization, and measuring productivity; leading edge technical topics, such as expert systems and artificial intelligence, and fourth generation languages; issues that are apparently losing importance as they lose their newness, such as information centers and telecommunications deregulation; and leading edge alignment topics, such as decision support systems, strategic systems, and external data.

It is wise to remember that in taking a first sweeping glance at the results, the rankings do not measure the absolute importance of any given issue. Importance varies according to industry categories, size of company, and many other variables. In a deeper sense, the ranking of the issues is an

A major surprise is the absence of end-user computing from the top group of issues.

indication of the managerial bias of the survey population. The lower ranking of newer or more narrowly focused items reflects accurately the character and concerns of managers as opposed to technical practitioners. Given the strong orientation toward aligning MIS with corporate goals revealed in the survey's top-rated issues, the lower ranking of many items is even more understandable.

The strong response rate lends weight to the survey findings and encourages comparisons with prior surveys. In particular, comparisons with the 1985 CSDP Opinion Survey and another published by the *MIS Quarterly* (September 1984) elicit some significant trends.[1]

Because the actual sampling for the 1984 survey was done over a six-month period in 1982-83, the trends uncovered by comparison with current findings cover almost four years. Fig. 2 compares rankings from the three surveys.

These can be examined in several ways. Easily overlooked are the eight issues that have remained relatively stable across the three studies. Using the 1986 rankings, that group is shown in Fig. 3.

FIG. 1

AVERAGE RANKINGS

Respondents rated issues as not important, somewhat important, fairly important, or extremely important. The overall rankings are derived from the average rating across all respondents, with not important scored as 1, and extremely important as 4.

RANK	ISSUE	AVERAGE RATING
1.	**Aligning MIS with Business Goals**	3.54
2.	**Data Utilization**	3.49
3.	**Educating Senior Personnel**	3.33
4.	**Software Development**	3.31
5.	**Productivity**	3.26
6.	**Planning**	3.25
7.	**Integration of Technologies**	3.21
8.	**Telecommunications Technology**	3.17
9.	**Quality Assurance**	3.16
10.	**Office Automation**	3.09
11.	**Data Security**	3.06
12.	**End-user Computing**	3.00
13.	**Recruiting and Training**	2.91
14.	**Information Centers**	2.82
15.	**External Data**	2.82
16.	**Decision Support Systems**	2.81
17.	**Centralization**	2.70
18.	**Telecommunications Deregulation**	2.63
19.	**Measuring Productivity**	2.59
20.	**Fourth Generation Languages**	2.57
21.	**Strategic Systems**	2.42
22.	**CIM**	2.25
23.	**Expert Systems and Artificial Intelligence**	2.21

THREE CLUSTERS OF ISSUES

The issues group themselves neatly into three clusters near the top, middle, and bottom of the rankings. The top cluster, of course, reflects MIS's traditional mission, as discussed earlier. The middle group, significantly lower, represents MIS's initiatives toward end-user computing. The bottom group contains largely new or narrowly focused technologies that have not yet reached the mainstream. It should be noticed that Expert Systems and Artificial Intelligence had a much higher average rating in 1986 than in 1985, when it was far below all other issues.

Issues that have increased or decreased are described in Fig. 4.

Some items stand out dramatically, such as end-user computing, which has dropped precipitously. Even more interesting is the reversal in the positions of planning and alignment since the 1984 survey. Because they are so closely related, the exchange suggests that alignment has replaced planning as the key issue for MIS management. In the earliest study that mentioned the alignment issue ("support of the objectives and priorities of the parent organization"), it ranked sixth.[2]

Planning, of course, has always aimed at coordinating MIS objectives with corporate goals, but the popularization of a more strategic and "competitive" view of MIS has recently gained currency through the work of Warren McFarlan, Michael Porter, and enterprise studies like the annual CSDP-IBM conferences on Enterprise-Wide Information Management.[3] At the same time, the notion of making MIS more integral to senior management through a CIO has gained wider acceptance. Half of the 600 survey respondents indicated that their organization had a CIO. Hence, the hypothesis is that generic MIS planning has been displaced—or replaced—by the much more specific notion of alignment.

Looking at the other issues that have increased or decreased in importance, it is likely that the shift to an alignment perspective has had a clear "pulling" effect. Items like data utilization and education of senior personnel are pulled up sharply, one reflecting a technical and the other an organizational consequence of an alignment strategy. Telecommunications technology—again, an issue with strategic ramifications beyond its technical parameters—also can be seen as pulled up by alignment. In fact, decision support systems, which may have been pulled up by the alignment strategy, registered the largest gain in average rating from 1985 to 1986.

Turning from the alignment hypothesis to issues that dropped in importance, end-user computing and data security stand out above the rest. Why they have dropped is not obvious. To a great degree, end-user computing may appear a less monolithic issue, and addressing its component parts separately may decrease its overall importance. Managers may also feel more control over some of the components, which could explain the drop of data security. Finally, the two issues may simply be falling into line with the perceived importance of related issues, such as information centers and office automation, clustered in the middle of the rankings.

Other changes seem more obvious.

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[1] Curt Hartog and Martin Herbert, *1985 CSDP Opinion Survey* (St. Louis: Washington University, 1985); Gary W. Dickson, Robert L. Leitheiser, James C. Wetherbe, and Mal Nechis, "Key Information Systems Issues for the 1980's," *MIS Quarterly*, 8 (September 1984), pp. 135-59.

[2] E.W. Martin, "Critical Success Factors of Chief MIS/Dp Executives," *MIS Quarterly*, 6 (June 1982), pp. 1-9.

[3] W.F. McFarlan, J.L. McKenney, and P. Pyburn, "The Information Archipelago: Plotting a Course," *HBR*, Jan.-Feb. 1983, pp. 145-56; M.E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance* (New York: Free Press, 1985); R. J. Benson and M.N. Parker, "Enterprise-wide Information Management: An Introduction to the Concepts" (IBM L.A. Scientific Center, May 1985).

The drop in recruitment and training could be explained by market factors, while the decline in telecommunications deregulation may reflect an issue becoming less important because its effects are better known. In any case, the trends reveal MIS managers as more politically aware and more like business managers than is sometimes assumed.

End-user computing. The second section of the survey, which examines end-user computing's impact on the MIS function, partially supports the alignment hypothesis. For example, in describing how the MIS function has changed as users have undertaken more application development, 63% said MIS had assumed a more advisory role and 40% said that MIS was more strategically postured. (Many of the questions allowed multiple answers, so the percentages do not add up to 100%.)

IMPORTANT PATTERN RESULTS

Pursuing the alignment hypothesis obscures equally important patterns in the results. One very striking view emerges when the questions are grouped into four categories: Training, Data, MIS Roles, and Effects of End-user Computing.

In each of the four, the results can be examined by company revenues, size of dp shop, type of industry, and presence of a cio function. Results for certain questions were also classified according to responses on other questions.

Training. The results portray a diversity of approaches to the training of users. Responses to a question about how training should be delivered were almost equally divided among the following: in anticipation of user demand, as users request courses, and in assisting users to develop their own courses. Similarly, responses to inquiries concerning the ways MIS uses its staff for training also divide equally between "assign full-time staff" and "create liaisons to user management."

There were also significant variations among respondent types. Those who thought MIS had less power and that planning had become harder because of increased user participation were more likely to choose reactive approaches to training. That is, they were more likely to develop training and consulting on an "as needed" basis.

Another question asked for the objectives of the information center. Each of the six objectives listed was chosen by at least a quarter of the respondents, with "consulting help on specific problems" and "training in hardware and software packages" chosen by more than half.

Interestingly, a question that asked for the areas in which MIS should educate users drew high numbers (60% to 70%) for such traditional MIS areas as "requirements definition" and "backup and recovery techniques." This suggests two interpretations: either MIS managers are willing to let users develop their own applications, or MIS managers have been forced to relinquish applications to users yet still feel accountable for the results.

These high numbers also suggest that MIS managers are willing to let go of users who have been entrusted with the crucial role of developing applications.

Data. The results in this category contain few surprises. MIS tends to set standards either for all corporate or for some departmental systems. Access to corporate data is in turn governed more by MIS or corporate policies than by technical restraints. Smaller business units (revenues less than $25 million) and smaller shops (fewer than 20 dp employees) were more likely than others to choose departmental standard setting and technical constraints to data access.

MIS frequently, but not universally, had the overall responsibility for assuring the quality of corporate data. Each of the aspects listed (security, timeliness, integrity, etc.) was chosen by 60% to 77% of the respondents. These numbers were lower for smaller shops and business units.

MIS roles. Questions grouped under MIS roles indicate the ferment now occurring in the field. Predictably, the MIS director was most frequently chosen as the job category most responsible for managing technology changes in the organization, but only 38% chose that response. Ten percent chose no one, and respondents who made this choice were more likely to think that MIS had less power and that planning was harder. They were also more likely to work in companies that had no cio. Respondents in the Trade and Finance categories were less likely to say no one; those in the Utility category were more likely to choose that response.

A question about future MIS roles as users assume more responsibility for technology found the highest number (74%) viewing MIS in a consulting role to departmental systems. The percentage is even higher in the Trade category. The percentages across all the other response categories are relatively modest, yet the categories describe MIS's traditional, central roles. For example, only 58% said that developing

FIG. 2
ISSUES RANKED BY YEAR OF STUDY

ISSUE	1984 RANK	1985 RANK	1986 RANK
Planning	1	1	6
End-User Computing	2	4	12
Integration of Technology	3	7	7
Software Development	4	3	4
Productivity	5	NA	5
Alignment	7	2	1
Recruiting and Training	8	15	13
Data Utilization	9	4	2
Decision Support Systems	10	19	16
Office Automation	12	11	10
Telecommunication Technology	13	10	8
Data Security	14	6	11
AI and Expert Systems	18	21	23
Educating Senior Personnel	—*	8	3
Quality Assurance	—	9	9
Information Centers	—	12	14
Telecommunications Deregulation	—	13	18
Measuring Productivity	—	14	19
Fourth Generation Languages	—	16	20
Centralization	—	17	17
External Data	—	18	15
CIM	—	20	22
Strategic Systems	—	—	21

*Issue not included in prior surveys. NA: not asked

FIG. 3
STABLE ISSUES

ISSUE	1986 RANKING
Software Development	4
Productivity	5
Quality Assurance	9
Office Automation	10
Information Centers	14
Centralization	17
CIM	21
Expert Systems and AI	23

MIS managers are more politically aware and more like business managers than is sometimes assumed.

core business systems would be a major MIS role, and only 49% said that operating core business systems would be. Five years ago, these rates would probably have been much closer to 100%. When the focus moves to smaller shops, the percentages drop into the 30s.

SEE MIS FUNCTIONS CHANGING

Clearly, MIS managers view their departments' roles and functions as changing in fundamental ways as a result of users acquiring information technology. When asked how their departments' roles and functions have changed as a result of users acquiring information technology, 40% said their departments were more strategically postured, while 33% said they were more operationally oriented. This contrast suggests that the impact of users has been felt in widely differing ways. Other new roles were emphasized; among them, MIS's telecommunications responsibility was seen as increasing sharply as a result of micro-to-mainframe links and LAN products.

Effects of end-user computing. The most interesting results appear in this category. Responses to a question identifying the MIS roles most affected by the transfer of information technology to users did not point dramatically to the MIS director (19%) or department head (15%), though they were chosen most frequently.

The most dramatic division of results occurred in response to an item asking how the power of the central MIS department has been affected by users undertaking more applications development. About half (46%) said the department was not affected. The remaining half divided almost equally: 24% said less powerful, while 27% said more powerful. Smaller business units within this half gave more of the latter response and fewer of the former, possibly because MIS professionals are closer to users in smaller organizations. By industry category, Utilities were more likely to choose less powerful; Trade, Finance, and Government were more likely to choose more powerful.

The same sharp division of opinion emerged in an open-ended question that asked how the climate of MIS planning changed as a result of increased user participation. About 25% of the responses were classified as better or more cooperative, and another 25% as harder. Another 15% indicated that the climate was unchanged, and together these three categories comprise about two thirds of all responses. Only 7% said that the planning climate had a more strategic flavor.

Comments help to bring out the range and intensity of the responses. One respondent wrote, "Users have participated for the past three to four years. Each year the process has become more integrated and better tuned as awareness increases. We start earlier, we gather more information, and top management plays a role in the final approval or deferral of automation objectives. MIS operating and capital budgets come from this process."

Another responded, "Planning is shifting toward user requirements. Instead of telling the user what he or she will be using, we ask users what will make them better decision makers."

In the same vein, "User participation is real world, an eye-opener to the flexibility needed in today's environment. But changes in old ways of thinking are slower than needed."

Some comments are less positive. "We are becoming package installers and data custodians, not report writers"; "Planning eliminated"; "More confused"; and finally, "Greater dysfunctional centralization of decision power. The blind leading the sighted."

FIG. 4

ISSUES THAT CHANGED RANKS

ISSUE	1984 RANK	1985 RANK	1986 RANK
UP			
Alignment	7	2	1
Data Utilization	9	4	2
Educating Senior Personnel	—	8	3
Telecommunication Technology	13	10	8
External Data	—	18	15
DOWN			
Planning	1	1	6
End-User Computing	2	4	12
Integration of Technology	3	7	7
Recruiting and Training	8	15	13
Telecommunication Deregulation	—	13	18
Fourth Generation Languages	—	16	20

USERS NOT COMPETENT

When we asked what the single most difficult problem created by user participation was, user incompetence or intransigence was most frequently mentioned (19%). Complaints about users ran the gamut from ignorance to arrogance to lack of commitment. "Ignorance of the complexities and lack of good tools," wrote one respondent. "Everything they read makes it appear simple"; "Everyone is an expert," another noted. "They know the 'perfect' answer to meet their needs"; "False presumption of expertise and consequent disputes over IS strategy." Only about one third of those who identified user incompetence as the major problem had a CIO, vs. 55% of all others.

Resentment of users is hardly news, of course, but considering that the respondents were predominantly managers, it is interesting that no other category drew more than 11% of the answers. About 11% indicated that control of standards was more difficult, and another 9% said that providing education or training was a major problem. Another 10% pointed to added cost or effort, and 10% mentioned data (access, security, integrity).

One question asked how technology transfer has worked in reverse—from users back to MIS. It was the least understood item in the survey: many did not answer, or gave inappropriate answers. The intention of the item was to see if technology transfer has begun to come full circle, from MIS to users and back to MIS.

For some respondents, the item was again an opportunity to blast the enemy: "Users seldom present a coherent requirement. They want 'packaged' software on PCs, but don't want to accept limits and restrictions of the software. MIS is expected to 'plug in a few changes' "; "When a user solution doesn't work or user staff changes, especially when the guru leaves, MIS must be able to step in and take over, frequently on short and hostile notice." For others, it was a chance to reassert eternal verities, such as taming the wild user: "At a given level of frustration the user will give back system responsibility. The user then is more sympathetic and patient with MIS problems"; "The micro originally created a barrier for the end users, but now they are crawling back to MIS for expert help instead of going to salesmen."

Those who understood the item—

Respondents attach much less importance to end-user computing than was true several years ago.

admittedly a subjective judgment—gave interesting answers. "MIS serves as an information clearinghouse," one commented, "and users are field testing programs and equipment." Another tied the item directly into MIS productivity needs: "Technology transfer has broadened the traditional programmer's tool kit. Programmers are now using end-user tools [hardware and software] to increase productivity, speed of development, and the quality of the finished product." Another attributed the benefit to better communication: "I feel that in our business the transfer is just getting started. I also feel that it has helped MIS to see real business needs of the user. There is more communication between user departments and MIS, which helps to solve the *real* problem."

NEW VIEW OF MIS ROLES

Most interesting are the answers pointing to a new view of MIS roles and capabilities: "Technology transfer has caused us to look again at our productivity tools and how we measure productivity"; "Users have discovered ways of using existing systems of technology that we were not aware of"; "Yes, users have forced improvements. Users are more expert in some query and analysis packages, such as SAS"; "The users provide and test the knowledge base of what's new and useful"; "We have several users doing things we are not able to stay abreast of."

Still more on new MIS roles: "Technology transfer has made us more aware of the user's needs, constraints, and interests in the automation process. I believe it has created a closer working relationship between the persons utilizing data processing services and MIS personnel, as compared to the earlier days of automation."

In 1986, MIS managers are seeking to align MIS with corporate strategic plans and objectives. To succeed, they must both educate senior management and manage data utilization as effectively as possible. In addition, they must perform MIS's traditional mission of software development to the satisfaction of users, ideally with increased productivity. In general, the overall ranking of the issues portrays respondents as more politically astute and business oriented than is often thought.

On the whole, the respondents attach much less importance to end-user computing than was true several years ago. The pc may be a star, but most managers are not hitching their dp wagons to it.

The broad picture, then, conveys a decidedly managerial outlook, with MIS managers clearly focused on the main chance. Yet, in looking up to alignment with senior management, managers may overlook the productivity potential of some lower-rated issues, such as fourth generation languages, and the continuing power shifts occurring around end-user computing. The counterrevolution may be under way, but the enemy is still alive and kicking. As noted in one comment, "Users have little or no past to be prisoner of." ◉

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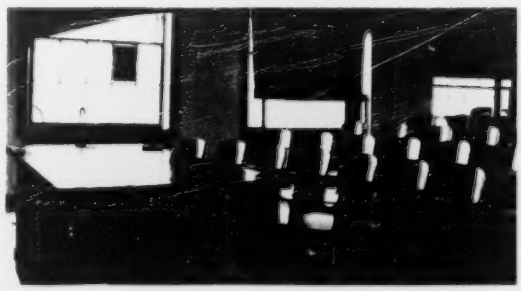

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